UDOT RESEARCH & DEVELOPMENT REPORT ABSTRACT

1. Report No. UT 01.03	**2. Government Accession No.**	**3. Recipients Catalog No.**
4. Title and Subtitle R&D Network Shadow Advanced Traffic Operations Center to Model Signal Timing for Severe Weather Conditions	**5. Report Date** January 2001 **6. Performing Organization Code**	
7. Author(s) Peter T. Martin, Ph.D., C.Eng. Blake G. Hansen H. Joseph Perrin, Ph.D., P.E., P.T.O.E.	**8. Performing Organization Report No.**	
9. Performing Organization Name and Address University of Utah Department of Civil and Environmental Engineering Salt Lake City, UT 84112-1107	**10. Work Unit No.** **11. Contract No.**	
12. Sponsoring Agency Name and Address Utah Department of Transportation 4501 South 2700 West Salt Lake City, UT 84119-5998	**13. Type of Report and Period Covered** Final Report July 1999 to December 2000 **14. Sponsoring Agency Code**	

15. Supplementary Notes

Samuel E. Sherman, UDOT Research Division, Project Manager

16. Abstract

Most individuals living in cold weather climates realize that on snowy days their commute will take longer. While traffic volumes are often lower, the combination of reduced speeds and capacity cause severe congestion particularly in signalized urban networks. Signal coordination that reduces traffic congestion in typical clear conditions results in an uncoordinated and sub-optimal timing plan. This paper examines traffic parameters for developing signal timings during inclement weather conditions. With the completion of the Utah Department of Transportation (UDOT) Advanced Transportation Management System (ATMS), there is an opportunity to change signal timing plans by communicating with each controller from the Transportation Operations Center (TOC). With this ability, it has become feasible to have a library of special signal timing plans with one allocated for inclement weather conditions. Traffic flow data is collected over a range of seven inclement weather severity conditions at two intersections for the 1999/2000 winter season. The data indicates that the largest decrease in vehicle performance occurs when snow and slush begins to accumulate on the road surface. Saturation flows decrease by 20%, speeds decrease by 30%, and start-up lost times increase by 23%. UDOT is now developing and implementing modified inclement weather coordinated signal timing plans for the major signalized corridors in the Salt Lake Valley. The determination of when to implement an inclement weather signal timing plan is based on four general criteria: storm severity, projected duration, area of influence and immediately projected running speeds. With these considerations, traffic engineers can determine whether to implement an inclement weather signal timing plan.

17. Key Words RWIS, Road Weather Information Systems, ATIS, Advanced Traveler Information Systems	**18. Distribution Statement** No Restrictions. Available from: UDOT Research Division, Box 148410, Salt Lake City, Utah 84114-8410 University of Utah Department of Civil and Environmental Engineering 122 South, Central Campus Drive #104 Salt Lake City, Utah 84112-0561

19. Security Classification (of this report) None	**20. Security Classification (of this page)** None	**21. No. of Pages** 85	**22. Price**